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and

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ENGINEERING ENRICHMENT PROGRAM

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ENGINEERING ENRICHMENT PROGRAM
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by
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Table of Contents

- (I) Introduction**
- (II) Program Objectives**
- (III) Program Implementations**
 - 1. Selection Process**
 - 2. Placement**
- (IV) Academic Program**
 - 1. Curriculum**
 - 2. Faculty & Staff**
 - 3. Study Session**
 - 4. Discipline**
- (V) Activities**
- (VI) Evaluation of Program**
 - 1. Week by week observation**
 - 2. Overall results**
- (VII) Projected Goals/ Conclusion**

Introduction

Morgan State University and the National Aeronautics and Space Administration proudly continued the NASA/Morgan Engineering Enrichment Program in the Summer of 1991. Although this Program has ran successfully for seven (7) consecutive summers, the Summer of 1991 marked the beginning of changes and additions. These changes were made in many areas, ranging from program implementation to academic curriculum. One of the few additions included motivational sessions. The changes and additions were made in order to better achieve the goals and objectives of the program. These changes and additions will be elaborated upon were appropriate.

Program Objectives

The main objectives of the NASA/MORGAN ENGINEERING ENRICHMENT PROGRAM are:

- o to increase the number of minorities interested in engineering and science, and
- o to assist those students in their transition from student to engineer.

The former will be achieved by providing the students with an opportunity to take part in many college engineering experiences, and by exposing the students to the industrial engineering environment. The exposure will take the form of field trips to government and private industrial agencies, and presentations given by engineers working in nearby agencies. The latter will be achieved by first introducing qualified high school graduates to a college engineering environment. This introduction will consist of a rigorous five week program designed to develop skills, such as, studying, test taking, and communicating, and to strengthen academic backgrounds, resulting in an increase rate of academic success in an engineering curriculum. This program will be administered during the summer, and upon successful completion of the program, the students will be admitted into the School of Engineering for the subsequent Fall semester. From that point on, the students' progress will be monitored, and counseling, tutoring and mentoring will be provided when applicable. Furthermore, the students will be assisted in seeking internships with federal and private agencies. These internships will further increase the interest and motivation of the students.

Program Implementation

1. SELECTION PROCESS

One of the changes made this year was in the number of students selected into the program. As apposed to twenty students in the previous years, thirty-four high school graduates were screened and selected to enter this years' program. Many of the selected students were recruited from high schools along the east coast. The program was publicized to these schools by visitation from Morgan counselors. In addition, informational brochures and applications were sent to inquiring students and high school faculty members. The faculty members aided in the process by identifying possible candidates. These possible candidates had to meet minimum requirements represented by a grade point average (GPA) of 3.0 and a combined SAT score of 900. Special consideration, however, was given to those students with good performance in Physics and/or Chemistry, and good recommendations from three high school faculty members. Of the students accepted, the average SAT and GPA scores were 872 and B respectively, with an average Math SAT of 469. Table 1 lists these scores for the accepted students.

Table 1: Listing of each students' high school average grade and SAT scores.

NAMES	CITY	H.S. GRADE	SAT(V	M	T)	SEX
E. Bailey	MD	GED	380	420	800	M
K. Baltimore	MD	B	360	520	880	F
J. Berry	PA	B	440	410	850	M
S. Bin-Yusif	NY	B+	400	580	980	M
W. Brown	MD	B	320	390	710	M
P. Choe	MD	B+	280	510	790	F
S. Contee	MD	B+	510	520	1030	F
R. Cordova	MD	B+	440	450	890	F
M. Cunningham	DE	B+	520	470	990	F
D. Davenport	MD	C+	410	460	870	M
D. Davis	MD	B	330	450	780	M
D. Downs	MD	B+	380	620	1000	M
D. Fennoy	MD	C+	310	350	800	M
C. Green	OR	B	310	390	700	F
D. Herring	MD	C+	420	370	790	M
T. Jefferies	MD	C+	350	490	840	M
J. Jemmott	MD	B+	340	440	780	M
D. Jones	MD	C+	440	510	950	M
T. Kelly	MD	B+	ACT 22=		1040	F
E. Kim	MD	B+	270	470	740	F
P. Leighton	MD	B	340	420	760	M
M. Lynch	MD	B	330	460	950	M
N. Maddox	DC	B	410	500	910	F
K. Merchant	MD	B	380	470	790	M
A. Payne	DC	C+	470	410	880	M
T. Perry	MD	B	330	460	790	F
M. Pompey	NY	B+	300	480	780	F
A. Pounds	TX	B+	ACT 20=		940	F
J. Richardson	MD	B+	430	390	900	M
S. Smith	PA	B	310	540	850	F
V. White	VA	C+	550	550	1100	M
T. Williams	MD	B	ACT 20=		940	F

2. PLACEMENT

The students admitted into the program were given a placement examination in Math. The results were used to show the students' competence. Those with high scores on the exam were placed in a Calculus I level; whereas, the lower scoring students were placed in Pre-Calculus level. Note, however, in the Calculus level the students progressed at an accelerated pace. The students at the Pre-Calculus level received a thorough review of the fundamentals before progressing into calculus topics. The remaining courses were taken by everyone.

Academic Program

1. CIRRICULUM

The academic curriculum was designed to strengthen the students background and initially expose the students to the courses that would be taken in the first two semesters. This curriculum consisted of the following courses:

Calculus/Pre-Calculus,
English 101,
Chemistry,
Physics,
Introduction to Computers, and
Introduction to Engineering.

Figure 1 shows a sample of how these courses were scheduled throughout the week.

There was a time period in the schedule which was labeled speaker where during that time people from upperclassmen students up to real professional engineers came to speak to the students on their jobs and or experiebnces moving up the ladder. During Introduction to Engineering time the students were working on a group project which this year was a solar car. The car project was completed on time and recieved a lot of publicity. On some occasions, field trips were planned, such as the trip to NASA GODDARD SPACE FLIGHT CENTER.

Figure 1: Sample of weekly course schedule.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
7:00-8:20	BREAKFAST	BREAKFAST	BREAKFAST	BREAKFAST	BREAKFAST
8:30-9:30	CAL	CHEM	CAL	CHEM	CAL
9:30-10:25	CAL	CHEM	CAL	CHEM	CAL
10:30-11:25	COMPUTERS	ENGLISH	COMPUTERS	ENGLISH	COMPUTERS
11:30-12:50	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
1:00-1:25	COMPUTERS	SPEAKER	COMPUTERS	SPEAKERS	COMPUTERS
1:30-2:30	INTRO ENG	PHYSICS	INTRO ENG	PHYSICS	INTRO ENG
2:30-3:30	INTRO ENG	PHYSICS	INTRO ENG	PHYSICS	INTRO ENG
3:30-4:55	INTRO ENG	SPEAKERS	INTRO ENG	SPEAKERS	INTRO ENG
5:00-6:00	DINNER	DINNER	DINNER	DINNER	DINNER
6:20-7:30	STUDY	STUDY	STUDY	STUDY	STUDY
7:30-8:30	STUDY	STUDY	STUDY	STUDY	STUDY
8:30-9:30	STUDY	STUDY	STUDY	STUDY	STUDY
9:30-10:30	PRE-CAL	PRE-CAL	PRE-CAL	PRE-CAL	PRE-CAL

2. FACULTY & STAFF

The staff required for the implementation of the NASA/Morgan Engineering Enrichment Program and their duties are listed below:

Program Director:

Overall coordinator of the program. Recruits and selects participants. In cooperation with the teaching faculty, develops academic curriculum. Counsels students periodically. Selects and obtains speakers.

Assistant Director:

A student who organizes program coordination. Compiles the list of student attending the program. Acts as liaison between the teaching faculty and the Program Director. Prepares required reports. Assigns schedule for tutors. Prepares weekly progress reports.

Secretary:

Handles all correspondences. Maintains files. Arranges meetings. Arranges transportation as required. Provides other secretarial functions.

Teaching Faculty:

Unlike previous years, all the courses except Intro to Computers, were taught by university professors. Intro to Computers was taught by an upperclass engineering student. Prepares and presents subject matter. Assigns homework problems. Prepares progress reports for the students.

Tutors:

Responsible for aiding students during study hours. Grads completed home assignments. Maintains students' notebooks.

The Tutors were the most important part of the staff. They were responsible for helping students in all class homeworks, reinforced the days lecture, and graded homeworks. Through the study sessions the Tutors helped the program to end in five weeks. They were for an average of four hours a day during the week and usually nine hours on the weekends for study sessions.

The Dormitory Aides were also tutors, but they were used to supervise the students whenever they were out of class, at study session or in the dormitories. the counselors worked as a link between the students and the Director. Their responsibilities were to dissolve any potential problems that the student might have during the five week period.

The faculty responsibility included preparing and presenting subject matter to the students and working along with the Tutors to help advise the students. They were required to give all daily quizzes as well as weekly exams to one of the tutors so that the grades could be recorded and their papers returned. The Faculty was also required to come to any meetings that the Director might call regarding them and their classes.

3. STUDY SESSION

The study session portion of the program entailed strengthening the student's background

3. CHANGES

Unlike last year and the year before thirty-four students were selected for the program. The students were given twenty-five homework problems per night and they

were completed that night during study session. Unlike last years program where the problems weren't due until the next day of the class. In the grading process, the students didn't get any patial credit for the work they completed, it was either totally right or totally wrong, whether it was a test, a quizzes, homework, or classwork no partial credit was given. The students were also given weekly exams to help them learn better test taking skills as well as to learn the information better. This year the students had regular University Professors unlike the previos years where the teachers were upperclassmen. These new implementations helped to make a smoother running program and help to tighten the student bond.